

## CLAIMS

What is claimed is:

1. A microelectronic component assembly, comprising:
  - 2 a first substrate having at least one contact;
  - 3 a second substrate having at least one contact;
  - 4 at least one solder ball extending between said at least one first substrate contact and said at least one second substrate contact, wherein said at least one solder ball is attached to said at least one first substrate contact; and
  - 7 a compression mechanism for imparting pressure between said first substrate and
  - 8 said second substrate.

*Sub B1*

1. 2. The microelectronic component assembly of claim 1, wherein said first substrate comprises a microelectronic device package.

*Sub B2*

1. 3. The microelectronic component assembly of claim 1, wherein said first substrate comprises a carrier substrate.

*Sub B27*

1. 4. The microelectronic component assembly of claim 1, wherein said first substrate comprises a microelectronic device.

1           5.     The microelectronic component assembly of claim 1, wherein said at least  
2     one second substrate contact comprises a recess defined by at least one sidewall  
3     extending into said second substrate.

1           6.     The microelectronic component assembly of claim 5, wherein said at least  
2     one recessed second substrate contact includes a width which is substantially the same as  
3     a diameter of said solder ball.

1           7.     The microelectronic component assembly of claim 5, wherein said at least  
2     one recessed second substrate contact has a semispherical surface which is substantially  
3     the same radius as a radius of said solder ball.

1           8.     A method of fabricating a microelectronic component assembly,  
2     comprising:  
3         providing a first substrate having at least one contact;  
4         providing a second substrate having at least one contact;  
5         attaching at least one solder ball on said at least one first substrate contact;  
6         aligning said at least one solder ball with said at least one second substrate  
7     contact; and  
8         imparting pressure between said first substrate and said second substrate.

1           9. The method of claim 8, wherein providing said first substrate comprises  
2 providing a microelectronic device package.

1           10. The method of claim 8, wherein providing said first substrate comprises  
2 providing a carrier substrate.

1           11. The method of claim 8, wherein providing said first substrate comprises  
2 providing a microelectronic device.

1           12. A microelectronic component assembly, comprising:  
2           a first substrate having a first surface and a second surface, wherein said first  
3           substrate first surface includes at least one contact;  
4           a second substrate having a first surface and a second surface; wherein said  
5           second substrate first surface includes at least one contact;  
6           at least one solder ball extending between said at least one first substrate first  
7           surface contact and said at least one second substrate first surface contact, wherein said at  
8           least one solder ball is attached to one of said at least one first substrate first surface  
9           contact and said at least one second substrate first surface contact; and  
10           a support structure for imparting pressure between said first substrate and said  
11           second substrate.

1           13. The microelectronic component assembly of claim 12, wherein said  
2 support structure comprises:  
3           a frame surrounding a portion of said first substrate,  
4           a backing plate abutting said second substrate second surface;  
5           a thermal plate extending over said frame and adjacent said first substrate second  
6 surface; and  
7           a plurality of retention devices extending through said backing plate, said frame,  
8 and said thermal plate.

1           14. The microelectronic component assembly of claim 13, wherein said  
2 plurality of retention device comprise a plurality of bolts having at least one nut retaining  
3 each of said plurality of bolts.

1           15. The microelectronic component assembly of claim 12, wherein said first  
2 substrate comprises a microelectronic device package including a microelectronic device  
3 attached to and in electrical contact with a first surface of an interposer substrate, and  
4 wherein said at least first substrate first surface contact comprises at least one contact on  
5 a second surface of said interposer substrate.

1           16. The microelectronic component assembly of claim 15, wherein said  
2 support frame comprises  
3           a frame surrounding a portion of said first substrate,

4 a backing plate abutting said second substrate second surface;  
5 a thermal plate extending over said frame and adjacent said first substrate second  
6 surface;  
7 a plurality of retention devices extending through said backing plate, said frame;  
8 and the thermal plate; and  
9 a resilient spacer extending between said thermal plate and said interposer  
10 substrate.

1 17. A method of fabricating a microelectronic component assembly,  
2 comprising:  
3 providing a first substrate having a first surface and a second surface, wherein  
4 said first substrate first surface includes at least one contact;  
5 providing a second substrate having a first surface and a second surface; wherein  
6 said second substrate first surface includes at least one contact;  
7 attaching at least one solder ball to one of said at least one first substrate first  
8 surface contact and said at least one second substrate first surface contact  
9 aligning said at least one first substrate first surface contact with said at least one  
10 second substrate first surface contact; and  
11 imparting pressure between said first substrate and said second substrate with a  
12 support structure.

1        18. A method of fabricating a microelectronic component assembly,  
2 comprising:  
3        providing a substrate having at least one contact on a first surface;  
4        disposing a frame on a first surface of a carrier substrate, wherein said carrier  
5 substrate first includes at least one contact;  
6        disposing a backing plate on a second surface of said carrier substrate;  
7        inserting a retention device through said backing plate, said carrier substrate, and  
8 said frame;  
9        attaching at least one solder ball to one of said at least one contact on said carrier  
10 substrate first surface contact and said at least one substrate first surface;  
11        inserting a substrate into said frame, wherein said at least one substrate first  
12 surface contact are aligned with said at least one carrier substrate first surface contact;  
13        aligning said at least one first substrate first surface contact with said at least one  
14 second substrate first surface contact;  
15        placing a thermal plate is placed over said frame to be retained by said retention  
16 device; and  
17        adjusting said retention device to imparting pressure between said substrate and  
18 said carrier substrate.

1        19. The method of claim 18, wherein inserting said retention device comprises  
2 inserting at least one bolt and wherein adjusting said retention device comprises adjusting  
3 at least one nut on said at least one bolt.

1        20. The method of claim 18, wherein providing said substrate comprises  
2        providing a microelectronic device package including a microelectronic device attached  
3        to and in electrical contact with a first surface of an interposer substrate, and wherein  
4        said at least one substrate first surface contact comprises at least one contact on a  
5        second surface of said interposer substrate.

1        21. The method of claim 20, further including disposing a thermal interface  
2        between a back surface of said microelectronic device and said thermal plate.

1        22. The method of claim 20, further including disposing a resilient spacer  
2        between said interposer substrate and said thermal plate.

1        23. A substrate contact for forming a non-reflow electrical contact with a  
2        solder ball, comprising:  
3                a recess defined in a substrate by at least one surface extending into said substrate;  
4        and  
5                a conductive material layered in said recess.

1        24. The substrate contact of claim 23, wherein said surface comprises at least  
2        one substantially vertical sidewall.

1 25. The substrate contact of claim 24, further including a width of said recess,  
2 including said layered conductive material, which is substantially the same as a diameter  
3 of said solder ball.

1 25. The substrate contact of claim 23, wherein said at least one surface  
2 extending into said substrate comprises a semispherical recess, wherein an upper surface  
3 of said conductive material has substantially the same radius as a radius of said solder  
4 ball.

1 26. The substrate contact of claim 25, further including a resilient material  
2 disposed between said substrate and said conductive material layer.

1 27. A substrate contact for forming a non-reflow electrical contact with a  
2 solder ball, comprising:  
3 a recess define in a substrate by at least one surface extending into said substrate;  
4 and  
5 a conductive material layered over said recess forming a void in said recess.